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Shock-Induced Chemical Reaction in Organic and Silicon-Based Liquids STEPHEN SHEFFIELD, DANA DATTELBAUM, DAVID ROBBINS, RICK ALCON, RICHARD GUSTAVSEN, Los Alamos National Laboratory, DETONATION PHYSICS TEAM — Shock-induced chemical reactions remain an area that needs to be closely studied to determine the influence of pressure, temperature, and chemical structure on reactivity. Several studies have been performed in the past that indicate dimerization, polymerization, and decomposition take place in different shock-produced pressure and temperature regimes depending on chemical functionality. We present results obtained from single-shock experiments on several organic and silicon-based liquids, which used embedded multiple magnetic gauges to measure the shock profile as a function of Lagrangian position in the liquid. A comparison will be made between reactivity in carbon vs. silicon-based materials. A discussion of the relationship between free energy and the input shock parameters producing chemical reaction will also be presented.

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